USSR UDC 619:576.851.55:576.809.33

URGUYEV, K. R., KIRILLOV, L. V., LYUBICH, F. D., LAVCHENKO, Ye. G., PANFILOV, I.D. and PLESKIKH, A. S.

"Toxin Formation by Cl. perfringens in a Casein-Pancreatic Nutrient Medium"

Moscow, Veterinariya, No 2, Feb 73, pp 39-40

Abstract: A study was made of the cultivation on a casein-pancreatic medium of Cl. perfringens, type D, that causes infectious entertoxemia of sheep and is used as a component part in the preparation of a concentrated polyvalent vaccine used against braxy, infectious enterotoxemia, and malignant dropsy of sheep as well as dysentery of lambs. On enzymatic hydrolysis of the casein at 42°C for 20-30 min, the medium, which contained 25% yeast water and 1% millet, had a high content of all peptide fractions, which form the principal source of N in toxin synthesis. The accumulation of epsilon-toxin was 4-6 times greater than in other media (e.g., Hottinger's medium). The formation of toxin was related to the content in the medium of albumoses with a high and medium molecular weight and depended on the amine coefficient of the medium (the ratio of non-protein N to the total amine N). The highest toxigenicity (20,000-24,000 Dlm/ml) was obtained at an amine coefficient in the 0.72-0.75 range.

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URGUYEV, K. R, et al., Veterinariya, No 2, Feb 73, pp 39-40

At increasing values of the coefficient to 0.91 and higher, the toxin content dropped sharply (to 4,000-6,000 Dlm/ml). The higher the content of free amino acids and the lower that of peptide fractions, the lower was the concentration of the toxin formed.

2/2

1/2 027 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--ADSORPTION OF MICROQUANTITIES OF YTTRIUM,91 FROM THE SEA WATER ON FLUOROPLASTIC,4, POLYETHYLENE AND PAPER -U-

AUTHOR-(02)-IVANOV, V.A., LYUBIMOV, A.A.

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TOPIC TAGS--ADSORPTION, SEA WATER, POLYETHYLENE, YTTRIUM, FILTRATION, ISOTOPE, HYDROLYSIS, FLUORINATED ORGANIC COMPOUND

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE MAXIMUM OF YTTRIUM 91 ADSORPTION FROM THE SEA WATER ON FLUOROPLASTIC 4, POLYETHYLENE AND PAPER FILTERS (BLUE BAND) WAS RECORDED BY THE END OF THE THIRD DAY. THE ADSORPTION HAS THREE STAGES. BY THE END OF THE FIRST STAGE, WHICH IS OVER WITHIN APPROXIMATELY 1.5 HOURS, A SLOW GROWTH OF ADSORPTION COEFFICIENTS IS OBSERVED. A COMPLICATED DEPENDENCE OF YTTRIUM ADSORPTION ON TIME IS CAUSED BY THE CHANGE OF YTTRIUM 91 STATE IN THE SEA WATER AS HYDROLYSIS PROCEEDS. FACILITY: INSTITUT BIOLOGII YUZHNYKH MOREY IM. A. O. KOVALEVSKOGO AN USSR.

UNCLASSIFIED

AA0044788 Lyubimov, A.N. UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent, 1/70

243949 NUCLEAR MAGNETIC RESONANCE SPECTROMETER, high resolution tuning method using gradients correction coils. It automates the tuning process, thus increasing the spectrometer productivity and its resolving power stability.

This is achieved by modulating with low frequency the current in the gradients correction coils when the tested spectrum is recorded. These l.f. modulation currentscarry the information about the signs and values of the nuclear magnetic resonance signal harmonic gradients, and are used for the gradients correction coils currents control. The modulation amplitude is low enough to make unimportant the spurious signals due to this modulation. 21.7.66 as 1093195/26-25. LYUBIMOV.A.N.et alia. SPECIAL DES. OFFICE ORGANIC CHEMISTRY INST.AC.SC.SSR. (1.10.69.) Bul 17/14.5.69. Class 421. Int.Cl.G 01n.

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19771606

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2/2

1/2 055 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--INTERNAL SHOCK WAVES IN GAS FLOW AROUND BLUNT CONES -U-

AUTHOR--LYUBIMOV, A.N.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, DOKLADY AKADEMII NAUK SSSR, VOL 191, NO 4, 1970, PP 783-786

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TOPIC TAGS--SHOCK WAVE, SHOCK WAVE ANALYSIS, SHOCK WAVE FORMATION, SHOCK WAVE PHYSICS, SHOCK WAVE PROPAGATION, CONE SHELL, MACH NUMBER, SPHERIC GEOMETRY, GAS FLOW

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2/2 055

CIRC ACCESSION NO--AT0118603

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHOR NOTES THAT IN EARLIER WORK ON THE POSSIBILITY OF SHOCK WAVES ARISING IN THE FIELD OF A SUPERSONIC IDEAL GAS MOVING AROUND THE SPHERICAL NOSE OF A CONE, THE REGION OF THE PARAMETER VALUES AT WHICH THE SHOCK WAVES OCCUR IS NOT ESTABLISHED. HE ALSO POINTS OUT THAT SEVERAL ARTICLES HAVE INDICATED THE DISCOVERY OF SHOCK WAVES AROUND BLUNT CONES WITH A BREAK AT THE JUNCTION POINT. IN THIS COMMUNICATION, HE SHOWS THAT INTERNAL SHOCK WAVES MAY ARISE BEHIND THE MAIN SHOCK WAVE FORMED BY A CONE HAVING A SPHERICAL NOSE WITHOUT A BREAK AT THE JUNCTION POINT. THE EXISTENCE OF THESE WAVES DEPENDS ON THE MACH NUMBER OF THE UNPERTURBED FLOW AND ON THE CHARACTERISTIC CONE ANGLE. WITHIN MACH NUMBER LIMITS OF 1.25 AND 2, INTERNAL SHOCK WAVES APPEAR FOR ALL CONE ANGLES LESS THAN 35DEGREES. AT MACH NUMBERS GREATER OR EQUAL TO 6, THEY DO NOT APPEAR FOR CONE ANGLES LESS THAN OR EQUAL TO 40DEGREES. AT MACH EQUAL TO 4, THEY APPEAR FOR CONE ANGLES GREATER THAN OR EQUAL TO 25DEGREES AND DO NOT APPEAR FOR ANGLES LESS THAN OR EQUAL TO 20DEGREES. THE INVESTIGATIONS PROVIDING THESE CONCLUSIONS USED METHODS OF FINITE DIFFERENCES. FIRST, THE STATIONARY FLOW AROUND A SPHERE WAS DETERMINED BY A SOLUTION AS A FUNCTION OF TIME OBTAINED FROM THE NONSTATIONARY PROBLEM; THEN THE SUPERSONIC FLOW WAS COMPUTED FROM THE FUNCTION VALUES WHICH WERE DETERMINED WITH HIGH ACCURACY. THE AUTHOR EXPRESSES HIS GRATITUDE TO V. V. RUSANOV FOR COMMENTING ON THE RESULTS AND TO E. I. NAZHESTKINA FOR HELPING WITH THE COMPUTATIONS.

UNCLASSIFIED

UDC 615.214.015.11

USSR

LYUBIMOV, B. I., Laboratory of the Pharmacology of Nervous System, Institute of Pharmacology, Acad. Med. Sc. USSR, Moscow

"Relationship Between the Chemical Structure and Psychotropic Activity Among the Derivatives of Benzodioxane, Trimethylbenzoic Acid and Trimethoxybenzoic Acids"

Moscow, Farmakologiya i Toksikologiya, Vol 34, No 4, Jul-Aug 71, pp 392-397

Abstract: Structure activity studies were carried out on derivatives of benzodioxane, trimethylbenzoic and trimethoxybenzoic acids, investigating their effect on conditioned avoidance and elementary conditioned reflexes, on the spontaneous motor activity, potentiation of the anesthetic action of sodium thiopental, on the hypothermal action and muscle relaxation. Most of the active compounds belonged to the trimethylbenzoic acid derivatives, dimethylamide being the most active. The quaternary salts exhibited toxic activity even though they lowered body temperature. Among the derivatives containing a trimethoxy group in the nucleus the trimethoxybenzyldimethylamine was the most active. Substitution of ethyl groups for methyl groups generally lowered the activity. Among the benzodioxane derivatives the methoxypropylaminomethyl-1,4-benzodioxane was most active.

USSR

UDC 615.214.22:547.869(Ftorphenazinum)

LYUBIMOV, B. I., RAYEVSKIY, K. S., OSTROVSKAYA, R. U., BARKOV, N. K., and KROLEVETS, G. N., Laboratory of the Pharmacology of Nervous System, Pharmacology Institute, Academy of Medical Science USSR, Moscow

"Neurotropic Properties of Fluzophenazine"

Moscow, Farmakologiya i Toksikologiya, Vol 34, No 3, May-Jun 71, pp 287-290

Abstract: Neurotropic properties of fluzophenazine -- 10-{γ-[4-(β-hydroxyethyl)-pipersinyl-1]-propyl}-2-trifluoromethylphenothiazine dihydrochloride were investigated. The drug was found to be a highly potent neuroleptic. It produced catalepsy, inhibited conditioned reflexes of avoidance, spontaneous motor activity, averted phenamine-induced hyperactivity, prolonged and potentiated the anesthesizing effect of sodium thiopental and hexobarbital, synchronized EEG, and blocked EEG-activation provoked by an acoustic stimulant and phenamine. Fluphenazine is an extremely potent antiemetic. Compared with triftazin, fluphenazine is less toxic and exceeds trifluoperazine in neurotropic activity.

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TITLE--STATISTICAL EQUATIONS OF TURBULENT MOTION IN LAGRANGE VARIABLES -U-

AUTHOR-(02)-LYUBIMOV, B.YA., ULINICH, F.R.

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. APPLICATION OF LAGRANGE VARIABLES TO A STATISTICAL DESCRIPTION OF EFFECTS CHARACTERISTIC FOR THE TURBULENT MOTION OF AN INCOMPRESSIBLE FLUID. THE SYSTEM OF LINKED EQUATIONS FOR THE LAGRANGIAN DISTRIBUTIONS OF FLUID PARTICLE (SELECTED POINTS OF THE VOLUME) COORDINATES AND VELOCITIES IS SEPARATED ON THE BASIS OF THE PRINCIPLE OF THE MUTUAL INDEPENDENCE OF LARGE AND SMALL SCALE MOTIONS. A CLOSED FORM EQUATION IS OBTAINED FOR THE JOINT PROBABILITY DENSITY OF THE COORDINATE AND VELOCITY OF A SINGLE FLUID PARTICLE. IN THE HOMOGENEOUS CASE, THIS EQUATION IS A JOINT NORMAL VELOCITY AND CORRDINATE DISTRIBUTION.

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USSR

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VATAZHIN, A. B., LYUBIMOV, G. A., REGIRER, S. A.

"Magnito-Gidrodinamicheskiye Techeniya v Kanalakh"(Magneto-Hydrodynamic Flows in Channels)

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- END -

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TITLE--DYNAMICS OF A CHANGE IN THE ELECTRON CURRENT FRACTION IN THE CATHODE REGION OF AN ARC DISCHARGE -U-

AUTHOR-(03)-BEYLIS, I.I., LYUBIMOV, G.A., RAKHOVSKIY, V.I.

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CIRC ACCESSION NO--AT0133547

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE UNSTEADY STATE PROBLEM OF THE DEVELOPMENT OF A CATHODE SPOT IS SOLVED BY USING THE MODEL SUGGESTED EARLIER (1969), IN WHICH THE IONIC CURRENT IS DETD. MAINLY BY THE DIFFUSION OF IONS WHICH ENTER FROM THE REGION OF IONIZATION. THUS, THE UNSTEADY STATE CHANGE IN THE FRACTION OF THE IONIC CURRENT IS DETD. BY SOLVING THE UNSTEADY STATE DIFFUSION EQUATION FOR THE CONDITIONS THAT THERE IS A SOURCE OF IONS WHICH RESULTS FROM THE IONIZATION OF NEUTRAL ATOMS BY ELECTRONS EMITTED FROM THE CATHODE. THE CALCNS. SHOW THAT THE THERMAL FIELD EMISSION ELECTRON SPOT CAN EXIST ON A HEATED SURFACE ONLY FOR A LOW VALUE OF THE ELECTRON CURRENT FRACTION (0.5-0.7), BECAUSE A HIGH SURFACE TEMP. CAN BE MAINTAINED ONLY BY THE IONIC COMPONENT OF THE CURRENT. FACILITY: NAUCH-ISSLED. INST. MEKH., MOSK. GOS. UNIV. IM. LOMONOSOVA, MOSCOW, USSR.

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ON THE THEORY OF QUANTUM ELECTROMAGNETIC WAVES IN METALS IN A MAGNETIC FIELD

E. A. Kaner, O. I. Lyubimov, V. G. Skobov

Coupled longitudinal and transverse quantum electromagnetic waves in metals located in a strong magnetic field are investigated. It is shown that the waves, whose velocity is close to the helicon phase velocity, are elliptically polarized in a plane perpendicular to the constant magnetic field. Waves whose velocity significantly differs from that of the helicon are longitudinal and their electric vector is polarized along the wave vector. Explicit expressions for the velocity dispersion of the waves are derived for slow waves.

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UDC 661.31.7:631.362:538.1

GOKHSHTEYN, YA. P., SAFONOV, A. A., LYUBIMOV, V. D.

"Physical-Chemical Behavior of Ceramic ZrO_2-Y_2O_3 and ZrO_2-CeO_2 Magnetohydrodynamic Generator Electrodes"

V sb. Magnitogidrodinam. metod polucheniya elektroenergii (Magnetohydrodynamic Method of Obtaining Electric Power--collection of works), vyp. 3, Moscow, Energiya, 1972, pp 328-347 (from RZh-Aviatsionnyye i raketnyy dvigateli, otdel'nyy vypusk, No 11, Nov 72, Abstract No 11.34.150)

Translation: The multisounding method was used to study the effect of the oxygen partial pressure in argon on the physical-chemical processes in ZrO_2-Y_2O_3 ceramic on passage of a current through it. It was demonstrated that during the course of the electrochemical processes on the current leads and in the reduced zirconium dioxide (black zircon), the linear relation between the potential difference and the length of the ZrO_2-Y_2O_3 system samples is distorted. The degree of distortion of the curves depends on the oxygen content in the argon. On passage of a current with a density of 2-3 amps/cm^2 through a refractory electrode made of ZrO_2-Y_2O_3 ceramic, its service life is limited to a few hours. The process of cracking of the specimens begins on the cathode. A study was made of the physical-chemical properties of ZrO_2-CeO_2 ceramic. It was demonstrated that zirconium dioxide and cerium dioxide

USSR

GOKHSHTEYN, YA. P., et al., Magnitogidrodinam. metod polucheniya elektroenergii, vyp. 3, Moscow, Energiya, 1972, pp 328-347

ceramic is a semiconductor with mixed conductivity. With an increase in the CeO_2 content in the composition, the electron component of the conductivity increases. The number of ion transfers is defined for different compositions of cerium dioxide and zirconium dioxide, and the volt-ampere characteristics are obtained for them. It is demonstrated that the 0.75 CeO_2-0.25 ZrO_2 specimens in atmospheric air have maximum electron conductivity and maintain a current of 2-3 amps/cm^2 for a prolonged period at 1,670° K without disintegration. There are 7 illustrations, 2 tables and a 12-entry bibliography.

2/2

UDC 546.821'21'26

USSR

BOGOMOLOV, G. D., LYUBIMOV, V. D., SHVEYKIN, G. P., and ALYAMOVSKIY, S. I. Institute of Chemistry, Ural Branch of the Academy of Sciences USSR

"Physicochemical Properties of Titanium Oxycarbides"

Moscow, Neorganicheskiye Materialy, Vol 6, No 11, Nov 70, pp 1961-1963

Abstract: A study was made of the stability of a series of TiC_xO_y preparations toward acids, and alkalies, and also to air oxidation. Ti, C_{bound}, C_{free}, and N_2 levels were determined in preparations made by vacuum sintering of mixtures of starting oxide $TiO_{1.03}$ and carbide $TiC_{0.84}$ to form tablets 10 x 10 mm in size. TiC_xO_y preparations were found to be stable toward concentrated and dilute HCl and H_2SO_4, both at room temperature and at elevated temperatures. The oxycarbide $TiC_{0.57}O_{0.44}$ proved to be most acid-resistant of the hot-pressed samples. The oxycarbide $TiC_{0.57}O_{0.44}$ showed the greatest resistance to air oxidation at 950, 1100, and 1250° C.

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USSR

UDC 546.821'26'21

BOFOMOLOV, G. D., ALYAKOVSKIY, S. I., SHVEYKIN, G. P., and LYUBIMOV, V. D., Institute of Chemistry, Ural Branch of the Academy of Sciences USSR

"Certain Structural Characteristics of Cubic Titanium Oxycarbide"

Moscow, Neorganicheskiye Materialy, Vol 6, No 8, Aug 70, pp 1405-1408

Abstract: This report presents information on the area of single-phase existence, concentration dependence of lattice periods, and degree of filling of the elementary TiC_xO_y unit cell. Seventy specimens were made by pressing carefully ground mixtures of the initial components, followed by sintering at 1500°C and 10^{-7} mm Hg for 30-50 hr. Sixty of the specimens were found to be single-phase specimens. The specimens were subjected to X-ray and chemical analysis. A phase diagram of the $Ti-TiC_{1.3}-TiO_{1.3}$ system at 1500°C and $p = 10^{-3}$ mm Hg is presented. Data on the full mutual solubility of cubic TiC_x and TiO_y phases accompanied by formation of the TiC_xO_y oxycarbide are confirmed. It is assumed that the concentration dependence of the lattice periods of TiC_xO_y is complex. The linearity of the function $n_C = f(x)$ is confirmed, where n_C is the number of carbon particles in a TiC_xO_y unit cell. 1/1

Acc. Nr: AP0046557 Ref. Code: UR 0216

PRIMARY SOURCE: Izvestiya Akademii Nauk SSSR, Seriya Biologicheskaya, 1970, Nr 1, pp 127-129

N. P. LVOV, V. I. LYUBIMOV, N. V. KARAPETYAN

PECULIARITIES OF THE OXIDATION METABOLISM AND NITROGEN FIXATION IN MYCOBACTERIUM AZOT — ABSORPTUM N. SP.

A. N. Bach Institute of Biochemistry, Academy of Sciences, USSR

The experiments carried out on suspensions of non dividing cells have shown that the nitrogen-fixing Mycobacterium azot-absorptum oxidizes the most important compounds of the tricarbon acids cycle and possesses a cytochromes set characteristic of aerobic microorganisms. However N_2 fixation in this microorganism proceeds more energetically under anaerobic or microaerophilic conditions.

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REEL/FRAME
19781820

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UDC: 548.0:539.371:537.228.1

USSR

LYUBIMOV, V. N.

"Anisotropy of Viscous Absorption of Elastic Waves in Crystals and Piezoelectric Materials"

Moscow, Kristallografiya, Vol. 15, No. 4, 1970, pp 645-652

Abstract: In the problem of viscous friction in crystals the difficulties arising in the treatment of the connection between the mechanical stresses and deformations in the elastic harmonic wave can be simplified by the covariant method. This method, conveniently applicable to the theory of electromagnetic and elastic wave theory in crystals, is used in this paper. The author investigates viscous absorption of elastic waves in cubic and rhombic crystals. Also investigated is the process of electrical relaxation in piezoelectrics, a process described by the equation

$$d\vec{D}/dt = -\nu(\partial U/\partial \vec{D}),$$

where $\vec{D}$ is the electric induction, ν is the kinetic coefficient tensor, and U is the internal thermodynamic energy. Some characteristics of elastic waves in piezoelectrics, and absorption in piezoelectric semiconductors are discussed. A table showing the influence of piezoelectricity on the phase velocity of quasi-longitudinal waves is given.

UDC:

USSR

LYUBIMOV, V. N. and SANNIKOV, D. G., Institute of Crystallography of the USSR Academy of Sciences, Moscow

"Surface Electromagnetic Waves in Uniaxial Crystals"

Leningrad, Fizika Tverdovo Tela, Vol 14, No 3, Mar 1972, pp 675-681

Abstract: The authors study surface polarization waves (electromagnetic waves in quasistatic approximation) in uniaxial crystals for arbitrary direction propagation and various crystal sections. It is shown that two branches of surface waves can exist under given conditions. A figure is given showing the frequencies of two branches of surface polarization waves as a function of the angles θ and φ. In particular cases the authors study surface electromagnetic waves of various types in magnetic and nonmagnetic, uniaxial dielectrics. The authors thank V.M. Agranovich and V.L. Ginzburg for their advice and discussion of the results. Original article: two figures, 26 formulas, and five bibliographic entries.

1/1

UNCLASSIFIED PROCESSING DATE--27NOV70

1/2 017

TITLE--ALLOY FOR ALLOYING STEEL -U-

AUTHOR-(05)-STROGANOV, A.I., POVOLOTSKIY, D.YA., NAZAROV, V.F., TULIN, N.A., LYUBIMOV, V.N.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 263,889

REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,

DATE PUBLISHED--10FEB70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CHEMICAL PATENT, STEEL CONSTITUENT, ALLOY STEEL, TUNGSTEN STEEL, SILICON STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

STEP NO--UR/0482/70/000/000/0000/0000

PROXY REEL/FRAME--3004/1833

CIRC ACCESSION NO--AA0132098

UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--27NOV70
CIRC ACCESSION NO--AA0132098
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE ALLOY HAS THE FOLLOWING COMPN.; W 55-75, SI 10-25 WT. PERCENT, FE THE REMAINDER.
FACILITY: CHELYABINSKIY POLITEKHNICHESKIY INSTITUT.

UNCLASSIFIED

AP9053077

UR 0289

LYUBIMOV

PRIMARY SOURCE: Izvestiya Sibirskogo Otdeleniya, AN SSSR, Seriya Khimicheskikh Nauk, Nr 12(162), Nr 5, pp 3-7

S. I. Golyshev,
V. N. Ljubimov, I. A. Tikhomirov

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LYUB

ISOTOPE EFFECTS IN THE ELECTROMIGRATION OF TIN (II) IONS IN MOLTEN SALT $SnCl_2$

The value of mass effect determined as

$$\mu = \frac{\Delta u}{u} \Big/ \frac{\Delta m}{m},$$

was found experimentally for tin isotopes in the electromigration of tin (II) ions in molten salt $SnCl_2$. In the temperature interval from 340 to 590°C this value can be represented by an empirical expression $\mu = -0{,}069[1-0{,}0003(T-340)]$.
For the salt $SnCl_2$ which has layer lattice this value is in a good accord withe the data obtained in an other paper [3].

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1949 1833

18

USSR

UDC: 621.378.325

GORLANOV, A. V., KALININA, A. A., LYUBIMOV, V. V., ORLOVA, I. B., PETROV, V. F.

"Investigation of the Possibilities for Making Telescopic Laser Amplifiers With High Amplification Factors"

Minsk, Zhurnal Prikladnoy Spektroskopii, Vol 17, No 4, Oct 72, pp 617-622

Abstract: Based on the theory of unstable resonant cavities, an investigation is made into the feasibility of attaining high amplification factors ($\sim 10^5$) in telescopic laser amplifiers. It is shown that when a single GOS-1001 light source is used, a three-pass amplifier is optimum, while the optimum number of passes is two for an amplifier using two such light sources. An amplification factor of approximately 160 000-200 000 is achieved (for a weak signal).

USSR UDC 621.375.82

LYUBIMOV, V. V., ORLOVA, I. B., FROMZEL', V. A.

"Effect of Nonhomogeneity of Population Inversion on the Transverse Structure of Oscillations in Solid-State Lasers"

V sb. Kvant-elektronika (Quantum Electronics -- Collection of Works), No 3, Moscow, "Sov. radio," 1972, pp 94-96 (from RZh-Fizika, No 1, Jan 73, Abstract No 1D881)

Translation: The effect of nonhomogeneity of population inversion, occurring during spiking operation, on the transverse structure of the radiation field of a laser was investigated on the basis of geometrical optics. The condition for the small effect of the nonhomogeneity of inversion in a direction perpendicular to the axis of the resonator on the radiation properties was obtained. The transverse structure of neodymium-glass laser radiation was investigated for various types of effects of inversion nonhomogenity. Authors' abstract.

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USSR

UDC 621.378.325

VANYUKOV, M. P., GORLANOV, A. V., LYUBIMOV, V. V., ORLOVA, I. B., PETROV, V. F.

"A Neodymium Glass Multichannel Monopulse Laser"

Moscow, Kvantovaya Elektronika, Sbornik Statey, No 4, "Sovetskoye Radio", 1971, pp 117-120

Abstract: The authors consider certain problems in the design of multichannel monopulse laser systems. An evaluation is made, and experimental data are presented on the influence which scattering of light in the gate has on the angular divergence of a beam from a laser with an unstable cavity. An experimental study is made of the limiting possibilities of a single-channel amplification system based on neodymium glass rods 45 mm in diameter and 600 mm long. A six-channel monopulse laser system is described with a total emission energy of 1 000 J and a pulse power of 15 GW. Four figures, bibliography of nine titles.

1/1

USSR UDC: 621.373:530.145.6

AVDEYEV, O. I., LYUBIMOV, V. V., PETROV, V. F.

"A Device for Automatic Alignment of the Mirrors in a Laser Cavity"

USSR Author's Certificate No 277136, filed 30 Jun 67, published 29 Oct 70 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6D242 P)

Translation: A device is proposed for automatically aligning the mirrors of a laser cavity. To improve alignment precision and ensure automatic realignment during operation, a luminous-spot autocollimator equipped with a turret head with interchangeable oculars is connected to electric drives which control its position in space. In the image plane of the autocollimator spot is a split-disc modulator which carries a photomultiplier. The "blind" mirror of the resonator is connected to servodrives which move the mirror in space. On the shaft of an electric motor between the mirrors of the cavity is a disc with transparent sectors. The output of the photomultiplier is connected to an electronic circuit which includes a device for amplification and frequency separation of the signals from the mirrors, and phase detectors whose outputs are connected to the servos which control the position of the autocollimator for the "blind" mirror.
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1/2 024 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--NONLINEAR PHENOMENA IN N GERMANIUM IN STRONG ELECTRICAL AND MAGNETIC FIELDS -U-

AUTHOR-(03)-GULZMAN, N.G., LYUBIMOV, V.E., TSIOLKOVSKIY, I.M.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(4), 1064-7

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--GERMANIUM SEMICONDUCTOR, NONLINEAR EFFECT, ELECTRIC FIELD, STRONG MAGNETIC FIELD, CURRENT DENSITY, HALL CONSTNAT, DRIFT MOBILITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/0220 STEP NO--UR/0181/70/012/004/1064/1067

CIRC ACCESSION NO--AP0127831
UNCLASSIFIED

2/2 024 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0127831

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN N-GE WITH THE ELECTRON CONCN., N EQUALS 6.2 TIMES 10 PRIME14-CM PRIME3 AT 20.4DEGREESK IN MAGNETIC FIELDS SMALLER THAN OR EQUAL TO 125 KOE AND ELEC. FIELDS SMALLER THAN OR EQUAL TO 60 V-CM, THE CURRENT VOLTAGE CHARACTERISTIC AND DEPENDENCE OF THE HALL CONST. ON C.D. WERE MEASURED. A JUMP WAS OBSD. IN THE VOLTAGE ON THE SPECIMEN, AS WELL AS A NEG. DIFFERENTIAL RESISTANCE AND ANOMALOUS DEPENDENCE OF THE DRIFT VELOCITY ON ELEC. FIELD. FACILITY: INST. FIZ. METAL., SVERDLOVSK, USSR.

UNCLASSIFIED

1/2 018 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--SPECTROSCOPIC PROPERTIES OF NO PRIME POSITIVE LUMINESCENCE CENTERS IN STANNIC CHLORIDE PHOSPHORYL CHLORIDE -U-

AUTHOR-(03)-TOLSTOY, M.N., LYUBIMOV, YE.I., BATYAYEV, I.M.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(4), 722-7

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--SPECTROSCOPY, CHLORIDE, LUMINESCENCE SPECTRUM, TIN COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1719 STEP NO--UR/0051/70/028/004/0722/0727

CIRC ACCESSION NO--AP0125340

UNCLASSIFIED

2/2 018 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0125340

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SPECTROSCOPIC CHARACTERISTICS OF ND PRIME3POSITIVE SOLNS. IN SNCL SUB4-POCL SUB3 (IN GENERAL, SNCL SUB4:POCL SUB3 EQUALS 1"10) WERE INVESTIGATED A$ ABSORPTION SPECTRA IN THE RANGE OF 0.4-2.5 MU AND AS LUMINESCENCE SPECTRA IN THE RANGE 0.8-2.0 MU. THE SPECTRAL PROPERTIES DEPENDED WEAKLY ON THE COMPONENT RATIO BETWEEN SNCL SUB4 AND POCL SUB3. BOTH TYPES OF SPECTRA WERE STUDIED IN THE FROZEN SOLNS. AT 77 AND 4.2DEGREESK. A DEPENDENCE OF THE RELATIVE INTENSITY AND LINE WIDTH ON THE FREEZING REGIME HAS OBSD. THE RESULTS ARE INTERPRETED ON THE BASIS OF THE EXISTENCE OF COMPLEX ND COMPOS. IN SOLN. SEVERAL TYPES OF LUMINESCENCE CENTERS ARE PRESENT, CONNECTED WITH EACH OTHER THROUGH NONRADIATIVE INTERACTION.

UNCLASSIFIED

USSR

UDC 621.397:535.67

AKSENTOV, Yu. V., LYUBIMOV, Yu. G.

"Experimental Determination of the Spectral Weight Function of Fluctuation Noise of the Color Channel of the SECAM-III System"

Materialy nauchno-tekhn. konferentsii. Leningr. elektrotekhn. in-t svyazi. Vyp. 3 (Materials of the Scientific and Technical Conference. Leningrad Electrotechnical Communications Institute, Vyp. 3), Leningrad, 1970, pp 21-24 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract NO 8G105)

Translation: This article contains the results of experimental determination of the spectral weight function of fluctuation noise of the color channel of the SECAM-III system. The experimental procedure is discussed.

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USSR

UDC 538.4

BICHENKOV, Ye. I., VOYTENKO, A. Ye., LOBANOV, V. A., LYUBIMOVA, M. A.

"Experimental Studies of Rapid Compression of Magnetic Flux in Cumulative Magnetic Systems"

7-ye Soveshch. po Magnit. Gidrodinamike. T. 1 [Seventh Conference on Magnetic Hydrodynamics, Vol 1], Riga, Zinatnye Press, 1972, pp 214-216, (Translated from Referativnyy Zhurnal, Mekhanika, No 11, 1972, Abstract No 11 B16 by I. M. Rutkevich).

Translation: A description is presented of an experimental explosive magnetic installation, producing magnetic field intensities in an inductive load of around 2.6 Moe in a time of less than 100 μsec. The working volume, from which the magnetic field is extracted into the load, is the space between eccentrically placed copper cylindrical rings. The interior of the smaller of the cylinders is filled with an explosive charge. An oscillogram of current and its derivative with respect to time is presented for one experiment.

1/1

USSR

UDC 533.9.07

VOYTENKO, A. Ye., LYUBIMOVA, M. A., and MATOCHKIN, Ye. P., Institute of Nuclear Physics, Siberian Branch of Acad. Sc. USSR

"Explosion Shock Tube"

Moscow, Teplofizika Vysokikh Temperatur, Vol 10, No 6, Nov-Dec, pp 1280-1284

Abstract: Experiments were carried out on a model of explosion shock tube. A stream of dense air plasma with a velocity of 25-10 km/sec was obtained by means of an explosive gas compressor. Photographing of the model was carried out under conditions when the stream behind the front of the shock wave became nontransparent. The experiments were carried out in a laboratory explosion chamber.

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Acc. Nr: AP0048380 Abstracting Service: CHEMICAL ABST. 5-70 Ref. Code: 71R0456

L

104230c Surface centers of γ-irradiated silica gel. EPR study of the effect of oxygen and nitric oxide adsorption. Livanbimova, O. I.; Kotov, A. G. (Fiz.-Khim. Inst. im. Karpova, Moscow, USSR). *Khim. Vys. Energ.* 1970, 4(1), 62-7 (Russ). The effect on the EPR spectrum of adsorption of NO and O on γ-irradiated silica gel is studied for 3 different gels. Electrons and holes are formed both in the vol. and on the surface of the gel. Adsorption values are given for the surface centers. When O is adsorbed O_2^- is present. B. J. Ikeler

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REEL/FRAME
19800088

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Acc. Nr: AT0107995

Abstracting Service: CHEMICAL ABST. 6/70

Ref. Code: 4R0020

-124749g Isolation of tobermorite-like hydrated silicates on quartz surfaces under conditions close to their stability limit. Lyubimova, T. Yu.; Melent'eva, G. G.; Rebinder, P. A. (Inst. Fiz. Khim., Moscow, USSR). *Dokl. Akad. Nauk SSSR* 1970 190(6), 1410–13 [Chem Technol] (Russ). A suspension of $3CaO.SiO_2$ obtained by the sepn. from the solid at the moment of max. concn. with respect to SiO_2, was filtered into hermetically sealed polyethylene vessels, empty or filled with quartz sand, at a solid-liq. ratio 1:4. The concn. [CaO] and $[SiO_2]$ and the ratio $(C/S)_l$ in the liq. phase and the amt., Q, of the new phase and $(C/S)_s$ in the solid phase were detd. at regular periods, τ. At τ = 5–7 hr $(C/S)_s$ increased sharply from the initial 3 to 12–15. Q increased during the 1st 17 hr, i.e. the period of the initial decrease of [CaO] from 3M. At τ = 24 hr [CaO] decreased and $[SiO_2]$ increased slightly, whereas Q and $(C/S)_s$ increased. The min. [CaO] at τ = 24–48 hr corresponded to the min. $(C/S)_s$ of 0.78–0.98. The labile characteristics of hydrated silicates of the tobermorite type in contact with the liq. phase of [CaO] ≦ 3–4M was confirmed. Dehydration of silicates, at the decrease of [CaO], occurs on the solid surface before it takes place in the liq. phase. GBJR

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REEL/FRAME
19891575

USSR

UDC 547.712.22:547.854:547.859.2

MAMAYEV, V. P., LYUBIMOVA, Ye. N. (DECEASED), Institute of Organic Chemistry, Novosibirsk, Siberian Department, Academy of Sciences USSR

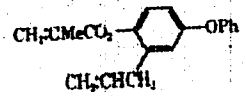
"Pyrimidines, XXII. The Interaction of Benzaldisurea with Indanone and It's O- and S-Analogs"

Novosibirsk, Izvestiya Sib Otdel Akad Nauk SSSR, Seriya Khim Nauk, No 2, Vol 1, pp. 96-99

Abstract: The authors performed condensation of benzaldisurea with α-indanone, 3-cumaranone and 3-thionaphthenone in an alcohol solution in the presence of HCl and in a solution of acetic acid. The α-indanone in both cases yielded the expected 2-oxo-4-phonyl-1,2,3,4-tetrahydro-5H-indano [1,2-d] pyrimidine, the structure of which is presented in the article. 3-cumaronone forms primarily 2-benzal-3-cumaranone plus about 10% 2-oxso-4-phenyl-1,2-dihydrobenzofuro [3,2-d] pyrimidine. 3-thionaphthenone, when condensed with benzaldisurea in acetic acid, small quantity of a material with the composition $C_{23}H_{18}N_2O_2S$.

Acc. Nr. AP0100237 Abstracting Service: CHEMICAL ABST. 6-70 Ref. Code UR0062

111844j **New mono- and difunctional monomers for polymerization.** Frunze, T. M.; Sakharova, A. A.; Lyubimskaya, R. A.; Ponkratova, T. M. (Inst. Elementoorg. Soedin., Moscow, USSR). *Izv. Akad. Nauk SSSR, Ser. Khim.* 1970, (1), 182-3 (Russ). The condensation of 4-$PhOC_6H_4OH$ with CH_2:$CHCH_2Br$ in acetone contg. K_2CO_3 gave 80% 4-$PhOC_6H_4OCH_2CH$:CH_2 (I), b_1 163-5°. Claisen rearrangement of I at 220° gave 75% 4,3-$HO(CH_2$:$CHCH_2)C_6H_3OPh$ (II), b_6 185-8°. Esterification of II



(III)

with H_2C:CMeCOCl in NaOH soln. gave 70% III, d^{20} 1.1069, n_D^{20} 1.5484. CPJR

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REEL/FRAME
19841627

USSR

UDC 612.014.21.015.12:(616.12:612.273.2.017.2

MEYERSON, F. Z., PANCHENKO, L. F., GOLUBEVA, L. Yu., LYUBIMOVA, O. N., and PORTENKO, N. G. Laboratory of Experimental Cardiology Institute of Normal and Pathological Physiology USSR, and Chair of Biochemistry Medicobiological Faculty, Second Moscow Medical Institute imeni N. I. Pirogov

"The Role of the Lysosome System in the Prophylactic Effect of Adaptation to High-Altitude Hypoxia in Disorders of the Heart"

Moscow, Kardiologiya, Vol 10, No 7, Jul 70, pp 71-79

Abstract: It was previously determined that systematic adaptation of animals to intermittent high-altitude hypoxia increases the resistance of the heart to acute stress. In an extension of this work, the lysosome systems containing protein hydrolases (e.g., DNA-ase, RNA-ase, and phosphatase) were studied, using trained and untrained rats. In trained animals, sudden high-altitude hypoxia was found to result in a general increase in the levels of the three lysosome protein ases (to 124-135%), a decrease in the content of free protein ases (68.4-81.5%) and a marked increase in the level of bound protein ases (244-268%). In untrained animals, levels of all protein ases decreased except the level of bound RNA-ase, which increased to 140.2%. Similar results were obtained in the latter group under conditions of coarctation. Sudden hyperfunction of the heart in trained animals

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USSR

MEYERSON, F. Z., et al., Kardiologiya, Vol 10, No 7, Jul 70, pp 71-79

results in a release of free protein ases and a decrease in other ases. It is generally concluded that the binding of protein ases resulting from intermittent adaptation to high-altitude hypoxia increases the resistance of the cardiac lysosome system to acute stress.

USSR

UDC 571.15.041

MEYERSON, F. Z., PANCHENKO, L. F., GOLUBEVA, L. Yu., LYUBIMTSEVA, O. N., and PORTENKO, N. G., Institute of Normal and Pathological Physiology, Academy of Medical Sciences USSR, and Second Moscow Medical Institute imeni N. I. Pirogov, Moscow

"Activity of Lysosome Enzymes of the Myocardium on Adaptation to High-Altitude Hypoxia and in Heart Injuries"

Moscow, Doklady Akademii Nauk SSSR, Vol 195, No 2, 1970, pp 499-502

Abstract: Acute hypoxia causes labilization of lysosomes of the myocardium. It is assumed that the prophylactic effect in heart lesions of adaptation to high-altitude hypoxia involves an increase in the resistance of the lysosome system, together with an increased capacity to retain acid hydrolases in a latent state, so that these enzymes do not damage the tissue. To check the correctness of this assumption, the effects of adaptation to high-altitude hypoxia on the content of free and bound acid DNA-ase, acid RNA-ase and acid phosphatase in the myocardium were studied on rats without heart lesions, with heart hyperfunction produced by experimental coarctation of the aorta, and with sympathomimetic injury of the heart produced by administration of novodrine (isoproterenol) in a dose that produces necrotic

USSR

MEYERSON, F. Z., et al, Doklady Akademii Nauk SSSR, Vol 195, No 2, 1970, pp 499-502

lesions. The rats were maintained for 6 hours per day over a period of 40 days at a pressure corresponding to an altitude of 6,000 m (the pressure was gradually reduced during the first week and then kept at this level). For rats without heart lesions, adaptation to high altitude hypoxia in this manner increased the total content of each of the three enzymes in the myocardium by 1/4-1/3 above that in controls. The content of the free enzyme fractions decreased by 20-30%, while that of the bound enzymes increased by a factor of approximately 2.5. Hyperfunction of the heart resulted in a decrease of the total content of all three enzymes, both when it was induced in rats after adaptation to high-altitude hypoxia and in rats that had not adapted. The decrease was lower for adapted than for unadapted rats, amounting to 35 vs. 47, 0 vs. 34, and 37 vs. 64% for acid DNA-ase, RNA-ase, and phosphatase, respectively. The smaller drop in the total content of lysosome enzymes in adapted animals was due to the fact that the content of the bound fraction was relatively greater. Similar relationships were found for rats in which heart lesions were produced by administration of isoproterenol (novodrine).

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USSR

UDC: 621.315.592

AVER'YANOV, V. L., KARPOVA, L. N., KOLOMIYETS, B. T., LYUBIN, V. M., FEDOROVA, Ye. I., Physicotechnical Institute imeni A. F. Ioffe, Academy of Sciences of the USSR, Leningrad

"Investigation of Local States in Glassy Semiconductors of the Selenium--Arsenic System"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 6, No 9, Sep 72, pp 1709--1715

Abstract: The authors study the change in photoelectric properties and characteristics of heat-stimulated depolarization with variation in the composition of glassy semiconductors in the selenium-arsenic system. When the concentration of arsenic in the specimen is increased there are changes in the sign of the photorectification effect, the spectral characteristics and kinetics of photoconductivity, the slope of the current-illumination characteristics, and the ratio between low-temperature and high-temperature maxima in the curve for heat-stimulated depolarization. The results are discussed from the standpoint of correlation between composition, structure and parameters of local states.

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1/3 019 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--ATTENUATION OF SPHEROIDAL OSCILLATIONS OF THE EARTH FOR SMALL N (ATTENUATION OF SPHEROIDAL OSCILLATIONS IN EARTH) -U-

AUTHOR-(02)-ZHARKOV, V.N., LYUBIMOV, V.M.

COUNTRY OF INFO--USSR

SOURCE--INSTITUTE OF PHYSICS OF THE EARTH; MOSCOW, DOKLADY AKADEMII NAUK SSSR, VOL 191, NO 3, 1970, PP 574-576

DATE PUBLISHED-------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--OSCILLATION, EARTHQUAKE, EARTH CORE, EARTH PLANET

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1994/0440 STEP NO--UR/0020/70/191/003/0574/0576

CIRC ACCESSION NO--AT0114720

UNCLASSIFIED

2/3 019 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AT0114720

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN EARLIER STUDIES THE AUTHORS (FIZIKA ZEMLI, NO 2, 1967; DAN, 177, NO 1, 1967) EXAMINED THE ATTENUATION OF TORSIONAL AND RADIAL OSCILLAITONS IN THE EARTH. IN THE CASE OF TORSIONAL OSCILLATIONS A COMPARISON BETWEEN EXPERIMENTAL DATA AND THEORY MADE POSSIBLE A ROUGH DETERMINATION OF THE DISTRIBUTION OF THE DISSIPATIVE FUNCTION Q IN THE EARTH'S MANTLE. BY USING THE DETERMINED Q DISTRIBUTION AND FORMULATING A THEORY OF PERTURBATIONS FOR RADIAL OSCILLATIONS OF THE EARTH IT WAS POSSIBLE TO EXPLAIN THE ANOMALOUSLY HIGH Q VALUES FOR RADIAL OSCILLATIONS OBSERVED AFTER THE CHILEAN EARTHQUAKES. ALL DATA INDICATE THAT Q IN THE EARTH'S LIQUID CORE IS AT LEAST AN ORDER OF MAGNITUDE GREATER THAN Q FOR THE MANTLE. IN A LATER STUDY (DAN, 180, NO 2, 1968) THE AUTHORS FORMULATED A THEORY OF PERTURBATIONS FOR SPHEROIDAL OSCILLATIONS OF THE EARTH AND EXAMINED THE ATTENUATION OF SPHEROIDAL OSCILLATIONS WITHIN THE EARTH. THIS PAPER, A LOGICAL CONTINUATION OF THE EARLIER STUDIES, GIVES THE RESULTS OF COMPUTATIONS FOR THE FUNDAMENTAL TONE TO N EQUALS 2T AND THE FIRST FOUR OVERTONES WITH N EQUALS 1-7. THESE OSCILLATIONS ARE INTERESTING BECAUSE THEY ARE ESSENTIALLY DEPENDENT ON THE PROPERTIES OF THE EARTH'S CORE, WHEREAS OSCILLATIONS WITH LARGE N ARE ALREADY EXPELLED FROM THE CORE INTO THE EARTH'S MANTLE. THE GUTENBERG BULLEN MODEL A WAS USED IN THE COMPUTATIONS. IN THE MODEL THE CRUST AND MANTLE ARE BROKEN DOWN INTO 34 LAYERS WITH PIECEWISE CONSTANT PARAMETERS. THE EARTH'S CORE IS ASSUMED TO BE LIQUID.

UNCLASSIFIED

3/3 019 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AT0114720

ABSTRACT/EXTRACT--THE 34 LAYERS OF THE CRUST AND MANTLE WERE COMBINED INTO FOUR LAYERS: A) UP TO 35 KM; B) 38-300 KM; C) 300-1,000 KM; D) 1,000-2,900 KM (CRUST, SUBCRUSTAL ZONE, TRANSITION LAYER AND LOWER MANTLE RESPECTIVELY). THE RESULTS OF COMPUTATIONS FOR SPHEROIDAL OSCILLATIONS XQ SUBSN ARE TABULATED. THE MOST IMPORTANT RESULTS OF THE COMPUTATIONS IN THIS PAPER IS THE LARGE Q VALUES WHICH WERE OBTAINED FOR SPHEROIDAL OSCILLATIONS WITH SMALL N. THE RESULTS GIVEN IN THE PAPER WILL GUIDE EXPERIMENTERS AS TO THE XQ SUBSN VALUES WHICH SHOULD BE EXPECTED FROM OBSERVATIONS.

UNCLASSIFIED

(4)

SO: JPRS 59279
14 June 73

SOME CHARACTERISTIC FEATURES OF GROWTH ON EMBOSSED SUBSTRATES

[illegible]

[Article by V. M. Krasovskiy, Ye. S. Lyubimov, A. A. Milov, K.-G. M. Shvartss Novosibirsk, Protsessy Rosta i Struktura Monokristallicheskikh Sloyev Poluprovodnikov -- Trudy Simpoziuma, Russian, Part 2, 1969, pp 150-154]

The mastery of the epitaxial process of growing silicon layers suitable for instruments permits improvement of the characteristics and facilitation of the technological process for making solid state circuits by the planar process.

It is no less prospective to use the epitaxial process to create the instrument structures since in this case it is possible to vary the electro-physical properties of the layers during the growth process. Two mutually complementing paths are possible: the local growth and growth on substrates with a shaped profile.

We have investigated some of the characteristic features of epitaxial growth of n^- and n^+-conductivity layers in the same process on substrates with a shaped profile. The shaped profile was created using the ordinary methods of photolithography anddeep etching of silicon through a mask of a photo-resistance. The outside view of the photographic standard is shown in photograph No 21.

Epitaxial growth was carried out at a substrate temperature of 1,200° C for an n-conductivity layer and 1,270° C for an n^+ conductivity layer. Special attention was given to obtaining epitaxial layers with a minimum number of lattice defects.

In the case of epitaxial growth, it was found that the preliminary oxidation of the silicon plates before the photolithographic processes leads to increased density of the packing defects in the epitaxial layer on all surfaces which were not subject to chemical etching during the photolithographic process (photograph No 22) (in the intervals between elements the packing defect density is two orders less than in the mesoregions, the upper plane of which was coated with SiO_2).

Prolonged holding in hydrochloric acid to remove the possible residual islets of silicon dioxide did not lead to significant variations of the packing

LYUBIMOV, Ye. S.

SO: JPRS 59279
14 June 73

PROBLEM OF OBTAINING MONOCRYSTALLINE LAYERS OF SILICON BY THE RHEOTAXIAL METHOD

[Article by Ye. S. Lyubimov, I. V. Filatova, A. A. Milov, V. G. Karpechenko; Novosibirsk, Plenochnyye [illegible] i Struktura Monokristallicheskikh Sloyev Poluprovodnikov -- Trudy Simpoziuma, Russian, Part 2, 1969, pp 160-164]

The development of the technological process for manufacturing instruments in semiconducting monocrystalline layers deposited on an insulating substrate has great significance for the creation of joint integrated circuits.

For the first time, the so-called rheotaxial method of obtaining monocrystalline silicon layers was proposed by Rasmanis [1, 2]. Its physical essence consists in the deposition of monocrystalline films on a polycrystalline substrate using an intermediate liquid layer.

We have performed studies of the possibility of obtaining monocrystalline layers of silicon by the reduction of silicon tetrachloride by hydrogen on polycrystalline insulating substrates coated with glass of complex composition. In order to discover the effect of the material and the substrate structure on the rheotaxial process, we used monocrystalline silicon as the substrates and also monocrystalline silicon coated with a layer of SiO_2 0.8-0.9 microns thick.

When selecting the polycrystalline insulating substrate which satisfies the requirements of the rheotaxial method, we discussed ceramics of the homogeneous and polycore type.

The selection of the glass for an intermediate liquid level is one of the main problems of the rheotaxial method of growing monocrystalline silicon films. The following requirements are, in our opinion, imposed on the glass.

1. The glass must not contain impurities of III and V group elements of the periodic table.

2. The coefficient of thermal expansion of the glass must correspond to the coefficient of thermal expansion of silicon ($\sim 40-44 \cdot 10^{-7}$ deg^{-1}).

3. At a temperature below 1,000° C the glass must be in the liquid state.

Ye. S.

Lyubimov, 1.

USSR

ZADYKHAYLO, I. B., KAMYNIN, S. S., LYUBIMSKIY, E. Z.

"Problems of Design of Computers Using High-Quality Units"

Sistemnoye i teor. programmirovaniye [Systems and Programming Theory -- Collection of Works], Novosibirsk, 1972, pp 126-235 (Translated from Referativnyy Zhurnal - Kibernetika, No 8 V589 by the authors)

Translation: This work is dedicated to a discussion of the problems of selection of boundaries between the hardware and software of a computer system. Principles are suggested for creation of a machine language which should allow broad development of apparatus and have greater stability, since it is selected on the basis of rather general considerations.

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UDC 53.07/.08+53.001.5

USSR

LYUBIN, V. M., PLAKHOV, S. A., FEDOROVA, G. A., TSUKERMAN, V. G.

"Experimental Vidicon Sensitive to Soft X-Radiation"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektronnoluch. i fotoelektr. pribory (Electronic Engineering. Scientific-Technical Collection. Electron Ray and Photoelectric Devices), 1970, No 1(15), pp 3-7 (from RZh-Fizika, No 1, Jan 71, Abstract No 1A323)

Translation: The characteristics of an experimental x-ray vidicon with a Be window and a target of vitreous material $Tl_2Se \cdot As_2Se_3$ sensitive to soft x-radiation in the region 5-30 kev are described. Authors abstract.

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USSR UDC 778.534.83

CHERKASOV, Yu. A., Candidate of Sciences, KISLOVSKIY, I. L., ANDRONOV, V. V., LYUBIN, V. M., Candidate of Sciences, AND FEDOROVA, Ye. I.

"Electrophotographic Spectrovisor for the Visible Area of the Spectrum Based on Recording Vidicon"

Optiko-mekhanicheskaya Promyshlennost', No 10, 1971, pp 28-32.

ABSTRACT: Results are presented from a study of the parameters of an electrophotographic spectrovisor, based on a recording vidicon. The spectrovisor can be used for observation and recording of spectrograms and photomicrograms in the visible area in a periodic mode at 25 frames per second and in the time integration mode with a resolution of 25 mm^{-1} and a sensitivity of up to 200 state standard units. The method of visualization of spectra is based on recording of an optical image by a recording photoconductive layer, so that the optical image is converted to the corresponding potential relief with subsequent visualization.

USSR UDC: 621.373+621.397.331.222+621.386.2/7

BAYKOV, A. P., BELAGO, V. A., BUDARNYKH, V. I., DOTSENKO, V. I., FEDOROVA, Ye. I., KURASHOV, E. M., LYUBIN, V. M., NALIVAYKO, V. I., TSUKERMAN, V. G., and SHESTAK, A. F.

"Methods of Recording X-Ray Images in a Science Research Automation System"

Novosibirsk, *Avtometriya*, No 6, 1971, pp 67-80

Abstract: A description is given of a complex of pulsed x-ray sources with memory elements for recording fast processes, along with highly sensitive systems for visualizing two-dimensional x-ray images of threshold intensity. The radiation required has a duration of 10^{-8} to 10^{-7} sec with a hardness of several hundred kev. For the recording equipment, photographic film and television systems were used, in which the memory cells were the semiconducting targets of sensor tubes. In such a system, the image is impressed directly on the target of the x-ray vidicon with a controllable memory, or is fixed by re-recording the video signal on a vidicon with [illegible] memory, thus allowing connection of the [illegible] input of an electronic computer. The [illegible] is to gather scientific data [illegible] [illegible] of the research procedure. [illegible] [illegible]

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USSR

UDC: 621.373+621.397.331.222+621.386.2/7

BAYKOV, A. P., et al, Avtometriya, No 6, 1971, pp 67-80

of the x-ray and recording equipment as well as sample oscillograms of various equipment items. The authors express their gratitude to Yu. Ye. Nesterikhin and A. M. Iskol'dskiy for their delineation of the problem and their supervision of the work. For his assistance with the experiments made using this equipment, the authors thank E. V. Yanshin.

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USSR

UDC 539.238:666.1

LYUBIN, V. M., and FEDOROVA, G. A.

"Production and Properties of Thin Films of Multicomponent Vitreous Semiconductors"

Moscow, Izvestiya Akademii Nauk SSSR -- Neorganicheskiye Materialy, Vol 6, No 10, Oct 70, pp 1891-1892

Abstract: The authors used the method of flash evaporation for the production of thin layers of vitreous semiconductors of the As-Se-Tl system. The resultant specimens of constant composition made it possible to trace variations in the optical and photoelectric properties of thin layers of the As-Se-Tl system with variations in composition. The article gives the dark resistivity, photosensitivity, and band gap values for layers of various compositions. The authors thank N. N. KUZ'MENKO and A. S. PRYAMITSYN for working out the procedure for preparing the specimens and YE. O. KURCHEVSKAYA and YU. F. ORLOV for performing the microchemical analysis.

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1/2 039 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--LOCAL STATES IN AMORPHOUS SEMICONDUCTORS STUDIED BY THE THERMOSTIMULATED DEPOLARIZATION METHOD -U-

AUTHOR-(03)-LYUBIN, V.M., AVERYANOV, V.L., KOLOMIYETS, B.T.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(2), 394-5

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--DEPOLARIZATION, THERMAL EFFECT, THIN FILM SEMICONDUCTOR, AMORPHOUS SEMICONDUCTOR, SELENIDE, ACTIVATION ENERGY, EXCITED STATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/1997 STEP NO--UR/0449/70/004/002/0394/0395

CIRC ACCESSION NO--AP0105071

UNCLASSIFIED

2/2 039 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0105071
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE THERMOSTIMULATED DEPOLARIZATION WAS STUDIED IN FILMS (GLASS LIKE AS SUB2 SE SUB3, GLASS LIKE TL SUB2 SE.AS SUB2 SE SUB3, AND AMORPHOUS SB SUB2 SE SUB3; 0.5-2 MU THICK, EVAPD. IN VACUO), POLARIZED AT SIMILAR TO 900EGREESK (10 PRIME4-10 PRIME5V-CM, WITH SIMULTANEOUS STRONG ILLUMINATION), DURING HEATING TO SIMILAR TO 300DEGREESK. THE ACTIVATION ENERGIES FOR VARIOUS GROUPS OF CENTERS ARE: 0.05, 0.17-0.25, AND 0.4-0.45 EV FOR TL SUB2 SE.AS SUB2 SE SUB3; 0.3 AND 0.45 EV FOR AS SUB2 SE SUB3; AND 0.1, 0.15-0.18, AND 0.22-0.25 EV FOR SB SUB2 SE SUB3. THE THERMOSTIMULATED DEPOLARIZATION METHOD MAKES IT POSSIBLE TO ELUCIDATE REGULARITIES OF THE SYSTEM OF LOCAL STATES IN THE FORBIDDEN GAP OF AMORPHOUS AND GLASS LIKE SEMICONDUCTORS WITH MORE DETAIL. FACILITY: FIZ. TEKH. INST. IM. IOFFE, LENINGRAD, USSR.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--27NOV70

1/2 012

TITLE--INCREASING THE EFFICIENCY OF MAINS WATER HEATING SYSTEMS -U-

AUTHOR-(04)-BELINSKIY, S.YA., GIRSHFELD, V.YA., KNYAZEV, A.M., LYUBIN, YE.S.

COUNTRY OF INFO--USSR

SOURCE--ELEKT. STANTSII (USSR), VOL. 41, NO. 3, P. 18-21 (1970)

DATE PUBLISHED-------70

SUBJECT AREAS--ENERGY CONVERSION (NON-PROPULSIVE), MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--THERMOELECTRIC POWER PLANT, TURBINE HEAT EXCHANGER, HEATING ENGINEERING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/0501 STEP NO--UR/0104/70/041/003/0018/0021

CIRC ACCESSION NO--AP0135964

UNCLASSIFIED

2/2 012

CIRC ACCESSION NO--AP0135964

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE VARIOUS METHODS OF CONNECTING MAINS WATER HEATERS AND ACCUMULATORS IN THERMAL ELECTRIC POWER STATIONS WITH DIFFERENT TYPES OF TURBINE EQUIPMENT ARE ANALYZED. RECOMMENDATIONS ARE GIVEN ON WAYS OF IMPROVING MAINS WATER HEATING CIRCUITS.

UDC 612.164-612.1

USSR

KARPMAN, V. L., LYUBINA, B. G., and SINYAKOV, A. F., Laboratory of Cardiology and Chair of Sport Medicine, Central Institute of Physical Culture, Moscow

"Circulation During Controlled Tachycardia"

Leningrad, Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenov, Vol 59, No 2, 1973, pp 292-298

Abstract: On a bicycle ergometer, trained athletes performed work at several levels of assigned heart rate. This was achieved by means of feedback information from an instrument with a programmed heart rate. The experimental subject's actual heart rate was being continuously recorded and compared with the programmed rate. A discrepancy between the two rates released a sound signal of high or low frequency, and the subject immediately adjusted his pedaling speed until the sound disappeared. In this way, the actual heart rate was kept within 2% of the programmed rates of 120, 130, 150, and 170 beats/min. It was found that the work rate increases in linear proportion with the heart rate. The stroke volume increases at a rate of about 8 ml per 10 beats increase in the heart rate up to a heart rate of 120-130 b/min. Thereafter, the average increase becomes about 2 ml/10 beats. Correspondingly, the cardiac output increases rapidly at first (from 5 L/min at rest to 14 L/min at a heart

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USSR

KARPMAN, V. L., et al., Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenov, Vol 59, No 2, 1973, pp 292-298

rate of 125 b/min) and slower subsequently (to a maximum of 20 L/min). With shortening duration of the cardiac cycle, not only the diastolic but also the systolic period becomes shorter. However, since the phase of isovolumetric contraction almost disappears, the ejection period is reduced to a smaller degree. On the average, the ejection rate increases approximately linearly from 360 ml/sec at rest to a maximum of 896 ml/min. Similarly, the ventilation perfusion ratio increases, to reach the value of 3.4 at the maximum work load. From the practical viewpoint, it appears important that the heart rate can be kept constant at any desired level by adjusting the work rate.

2/2

USSR

UDC 612.766.1+613.72/.73

KARPMAN, Prof. V. L.; BELOTSERKOVSKIY, Z. B.; LYUBINA, B. G.; Cardiology Laboratory, Central Institute of Physical Culture, Moscow

"Study of Physical Work Capacity in Sports Medicine and Clinical Practice"

Moscow, Sovetskaya Meditsina, Vol 34, No 2, Feb 71, pp 103-109

Abstract: Cumbersome graphic extrapolation in the determination of the physical working capacity at 170 heartbeats per minute (PWC_{170}) according to T. Sjoestrand (Acta Med. Scand., Suppl. 196, p 687, 1947) can be avoided if the formula PWC_{170} (kgm/min)= $N_1 + (N_2 - N_1) \cdot \left(\frac{170 - f_1}{f_2 - f_1} \right)$ is used, where N_1 and N_2 are the respective outputs in kgm/min of two successive physical exertions on a bicycle ergometer, and f_1 and f_2 the pulse rates registered 5 min after the first and second exertions. Tests carried out on men athletes, women athletes, and men and women not engaged in athletics showed that a simple linear relation

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USSR

KARPMAN, Prof, et al, Sovetskaya Meditsina, Vol 34, No 2, Feb 71, pp 103-109

between f and N applied in the $f \leq 170$ range in each of the four groups except that of men athletes, for which the increase of f with N at $N > 1,500$ kgm/min became less pronounced. By using the values of PWC_{170} calculated for the test subjects on the basis of the formula, the maximum O_2 consumption max V_{O_2} could be calculated from the formula max V_{O_2} (ml/min) = $1.7 X^2 PWC_{170} + 1,240$. Use of this formula made it possible to determine max V_{O_2} without subjecting the persons being tested to a muscular strain of a trying nature. The values of PWC_{170} and max V_{O_2} were found to be statistically valid and reliable indexes of physical performance.

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USSR

UDC 669.245.018.44(088.8)

PANASYUK, I. O., BRUSILOVSKIY, B. S., VILKOV, V. I., VORONIN, G. M., YEGOROV, YE. YE., YELKIN, I. S., KLIMOV, L. YA., KOVROVA, YE. A., KONTSEVAYA, YE. M., LYUBINSKAYA, M. A., MILENINA, YE. G., NIKHAYLOV, I. A., RAZUVAYEV, YE. I., SIROTKIN, A. I., SOLDATCHENKO, V. A., SPILITSIN, R. I., SHAPIRO, S. M.

"Nickel-Chromium Base Alloy"

USSR Author's Certificate No 276418, Filed 2 Jun 69, Published 16 Oct 70 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4I766P)

Translation: The heat-resistant alloy has the following composition (in %): C 0.03-0.1, Cr 30-40, W 3-5.5, Mo 2-4, Ti 0.5-1.5, Al 0.5-1.5, Nb 0.5-1.5, Ce 0.01-0.3, B 0.003-0.008, Ni, the rest. The alloy has increased heat resistance and also the following mechanical and physical-chemical properties at 1,100°: σ_B 8 kg/mm^2, δ 65%, $\sigma_{\text{stress-rupture}}$ 1 kg/mm^2, coefficient of linear expansion $15 \cdot 10^{-6}$ deg^{-1}, increase in weight after 100 hours of heating at 1,200° in the air 0.6 g/m^2. It is corrosion-resistant in a moist atmosphere under tropical conditions, in sea water, and in the products of combustion of highly sulfurous fuel.

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USSR

UDC 669.15'26-194

BIKEZIN, K. P., LYUBINSKAYA, M. A., TOPILIN, V. V., ZUBKO, A. M., and DZUGUTOV, M. Ya.

"Developing Production Techniques and Determining the Characteristics of Low-Carbon Kh28-VI Steel"

Moscow, Stal', No 2, Feb 71, pp 162-166

Abstract: This steel differs from the known Kh28 type by its especially low carbon content. While steels of high chromium content are known to be highly brittle at room temperature and are consequently limited in their application in objects operating under shock conditions, the low carbon content of Kh-28VI steel provides a shock strength of more than 20 kg/cm^2 with high resistance to corrosion. Its coefficient of thermal expansion is close to that of glass, so that it can be joined to that substance. Three techniques for obtaining iron with a carbon content of less than 0.01% had to be tested before the steel could be produced. Details of the process finally decided upon are given together with the steel's chemical composition, and the results of heat deformation tests are presented. There is a table of the steel's mechanical qualities for different

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USSR

BIKEZIN, K. P., Stal', No 2, Feb 71, pp 162-166

variations of its carbon content and treatment. The metal is manufactured in a vacuum induction furnace using high-purity iron and electrolytic chromium.

USSR

UDC 581.1:032+581.116

KOTLYAR, V. Z., LYUBINS'KIY, M. A., and KIRNOS, P. S., Institute of Plant Physiology, Academy of Sciences Ukr. SSR

"The Origin of Transpiration Water and Pathways of Heavy Water (D_2O) Movement in Leaf Tissues"

Kiev, Ukrains'kiy Botanicheskniy Zhurnal, Vol 17, No 6, Nov/Dec 70, pp 776-778

Abstract: Water enriched with D_2O was introduced through the roots into horse bean (Vicia faba), red pepper (Capsicum annum), and common cucumber (Cucumis sativus) plants. Within definite time intervals, the content of deuterium was determined in the transpiration water from the upper and lower sides of leaves, water of the epidermis of the upper and lower sides of leaves, and water of the mesophyll adjacent to the epidermis. The deuterium content in transpiration water 23-30 hrs after immersion of the roots into labeled water was higher as a rule than that in water of leaf tissues. This indicated that the water eliminated by transpiration moved chiefly through the extracellular free space of leaf tissue outside the protoplasts.

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Corrosion

UDC 620.197.5

USSR

LYUBLINSKIY, YE. YA., Central Scientific Research Institute of Shipbuilding Technology

"Effect of the Salinity of Sea Water on the Anodic Behavior of Protector Magnesium Alloys"

Moscow, Zashchita Metallov, Vol 19, No 2, Mar-Apr 73, pp 207-209

Abstract: The effect of the salinity of sea water on the electrochemical characteristics was investigated on cast specimens of widely used protector magnesium alloys of Ml4vch brand (four parts by weight nolabity) in artificial sea water, pH 7.8-8.4, at 18-20°. On anodic polarization of the alloys by a current of 1-10 A/m^2 density, a salinity increase of sea water from 6 to 50% results in an average decrease of the current officiency from 64 to 56% and of the current output from 1400 to 1230 A·hrs/kg. The interrelation between current consumption and salinity of sea water is expressed by the empirical formula $G=K_S \cdot i_{p_2} \cdot T$, where G= consumption of the protector material to protect a 1000 m^2 surface at salinity S (%), protective current density i_p (mA/m^2), and required service life T of the protection (years).

One figure, one table, two formulas, foru bibliographic references.

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UDC 541.183

USSR

LYUBITOV, YU. N., Academy of Sciences USSR, Institute of Crystallography, Moscow

"Statistical Approach to Adsorption Kinetics"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 46, Vyp 4, 1972, pp 951-955

Abstract: A function is presented for the distrbution of adsorption sites being occupied and the relationship of this statistical approach to the deterministic equations, Langmur's for example, is derived. The new function eliminates the averaging bias of the Langmuir equation and has the form

$$\tilde{k} = \sum_{k=0}^{N} k P_k (t')$$

in which $\tilde{k}$ is the average number of sites being occupied. Nine special cases are considered and a number of new correlations in the adsorption kinetics were noted. The statistical equations are based on the model of the adsorption system as a chain of successive reversible chemical reactions.

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UDC 53.07/.08+53.001.5

USSR

ZATSELYAPIN, A. M., LYUBITOV, YU. N., Institute of Crystallography, Academy of Sciences USSR

"Selector of Neutral Particle Velocities"

USSR Author's Certificate No 255420, Filed 9 Aug 68, published 19 Mar 70 (from RZh-Fizika, No 1, Jan 71, Abstract No 1A722P)

Translation: A device is proposed to increase the intensity of a particle beam behind a velocity chopper in which the selecting element is placed on the periphery of a cylindrical rotor which is also the armature of a reversed symmetric electric motor. The rate of rotation of the motor is synchronized by a stable frequency generator. The construction of the chopper also makes it possible to increase the rate of rotation and shorten the flight length, thus expanding the range of velocities. A. V. A.

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USSR

UDC 621.224(088.8)

KLABUKOV, V. M., LYUBITSKIY, K. A., OSTROUMOV, S. N.

"Hydroturbine Regulator"

USSR Author's Certificate No 261998, filed 3 Sep 68, published 25 May 70 (from RZh-Elektrotekhnika i Energetika, No 2, Feb 71, Abstract No 2 D-117 P)

Translation: A hydroturbine regulator (see the figure) containing an oil servodrive NA with a slide valve and choke installed on the oil drain after the slide valve is described. This regulator is distinguished by the fact that in order to insure optimal speed of closing the NA for each ratio of pressure and HA position on dropping the load, the choke is coupled via an arm to the pulley of a three-dimensional cam gear the cam shaft of which is connected to the NA, and the pulley arm is connected to the drive of the pressure meter.

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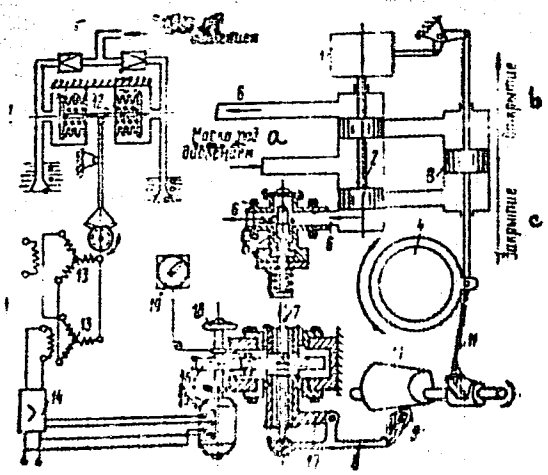
USSR

KLABUKOV, V. M., et al, USSR Author's Certificate No 261998, filed 3 September 1968, published 25 May 1970



Key: a. oil under pressure
b. open
c. closed
1 - regulator; 2 - slide valve; 3 - servomotor; 4 - NA; 5 - choke; 6 - overflow; 7 - connecting rod with spring; 8 - arm; 9 - pulley of the cam gear; 10 - cam shaft; 11 - pull rod; 12 - pressure meter; 13 - remote transmission; 14 - amplifier; 15 - electric motor; 16 - mechanical transmission; 17 - rotating bushing; 18 - manual drive; 19 - pressure indicator

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UDC: 512.25/.26+519.3:330.115

USSR

LYUBKIN, A. A.

"Solution of the Generalized Traveling Salesman Problem for Finite Symmetric Graphs"

V sb. Modelir. ekon. protsessov (Modeling of Economic Processes--collection of works), Moscow, Moscow University, 1971, pp 251-287 (from RZh-Matematika, No 11, Nov 71, Abstract No 11V725)

Translation: The author considers the traveling salesman problem where the number of trips in an optimum circuit to the vertices of the graph is not stipulated. A method is given which is a generalization of the method of branches and boundaries. This problem stems from the practical job of supplying hot water to predetermined points in such a way that the heat losses, which are proportional to the length of the network, are minimized. D. Epshteyn.

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